From: s 22
To: s 22
Subject: RE: Email to Buru [SEC=OFFICIAL]
Date: Saturday, 7 December 2019 12:16:00 PM
Attachments: image006.png
image007.png
image008.png
image009.png
image010.png
image011.png
image012.png
image013.png
image014.png
image015.png

Hi s 22
It applies to any sample Buru has sent to GA; These were all gases, as listed in the DAR.
No interpretive report was provided. The individual data sheets were supplied to Buru as they became available, and all data was collated and provided to s 22, as a contractor to Buru doing pet sys modelling, who then wrote the AEGC abstract, and acknowledged the data came from GA but he said this was released (but it was not, but that's s 22 for you)…

s 22

s 22 | Petroleum Geochemist
Energy Systems | Resources Division

t s 22 www.ga.gov.au

16-9481 GA Email Signature_social media-04

From: s 22 @ga.gov.au>
Sent: Friday, 6 December 2019 7:38 PM
To: s 22 @ga.gov.au>
Subject: Email to Buru [SEC=OFFICIAL]

Hi s

I have found the agreement with Buru on Trim in D2011-223164 so no need to send it to me.
If I understand well, the data remained confidential for a year after they were provided to Buru.
2 questions:

- Did the agreement cover particular samples or did it apply to any sample Buru has sent to GA? Just to confirm the samples in the DAR are covered by the agreement.
- Did you send them an interpretive report of the data?

I'll draft an email to Buru next week and send it over for your edits.
Cheers,

s 22

s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division

t s 22 www.ga.gov.au

16-9481 GA Email Signature_social media-04

Geoscience Australia acknowledges the Traditional Custodians of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islanders Cultures; and to elders past, present and emerging.

From: s 22
To: s 22
Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]
Date: Monday, 9 December 2019 4:52:11 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Yes I know….
We need to say that the gases are similar…some minor differences but hard to distinguish between pet sys on isotopes alone. Need to invoke local geology as well
Still worth writing about.
s

From: s 22 @ga.gov.au>
Sent: Monday, 9 December 2019 3:56 PM
To: s 22 @ga.gov.au>
Subject: FW: DAR report gas; can you send please [SEC=OFFICIAL]
I can see 3 oil families in Fig 3b but what's the story with the gases?
They seem to be quite similar.

s 22
s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division
t s 22 www.ga.gov.au

From: s 22
Sent: Monday, 9 December 2019 3:52 PM
To: s 22 @ga.gov.au>
Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]
Hi s 22
These figures look fine to me with the caveat that they need to match the extended abstract content. Do you have an outline for it or a rough draft?
I'm not familiar with the Canning, in one line what's the story?
Cheers,

s 22
s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division
t s 22 www.ga.gov.au

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From: s 22

Sent: Monday, 9 December 2019 11:35 AM

To: s 22

Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]

Thanks s 22

Not sure with s 22, he said he would do the map in about a week after completing s ' map, so perhaps later in the week.

We also need to decide what other figs to put in for the EFTF gas abstract and submit to [redacted].

What do you think of the following set of figs.

s

From: s 22 @ga.gov.au>

Sent: Monday, 9 December 2019 10:43 AM

To: s 22 @ga.gov.au>

Cc: s 22 - DMP s 22 @dmirs.wa.gov.au) <s 22 @dmirs.wa.gov.au>

Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]

Hi s and s 22 ,

Attached.

Do I need to chase a map with s 22?

Cheers,

s 22

| Organic Geochemist

Basin Systems | Minerals, Energy and Groundwater Division

t s 22 www.ga.gov.au

16-9481 GA Email Signature_social media-04

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From: s 22 @ga.gov.au>

Sent: Monday, 9 December 2019 10:40 AM

To: s 22 @ga.gov.au>

Cc: s 22 - DMP s 22 @dmirs.wa.gov.au) s 22 @dmirs.wa.gov.au>

Subject: DAR report gas; can you send please [SEC=OFFICIAL]

Hi s 22

Can you send a copy of the Canning gas DAR to s 22 and me. I forgot to pick up a copy on Sunday and not sure of latest version…

Thanks

s 22

From: s 22
To: s 22
Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]
Date: Monday, 9 December 2019 11:35:09 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
GAS_CANNING_EFTF Dec2019.pptx

Thanks s 22
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Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]

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Basin Systems | Minerals, Energy and Groundwater Division

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To: s 22 @ga.gov.au>
Cc: s 22 @dmirs.wa.gov.au) s 22 @dmirs.wa.gov.au>
Subject: DAR report gas; can you send please [SEC=OFFICIAL]

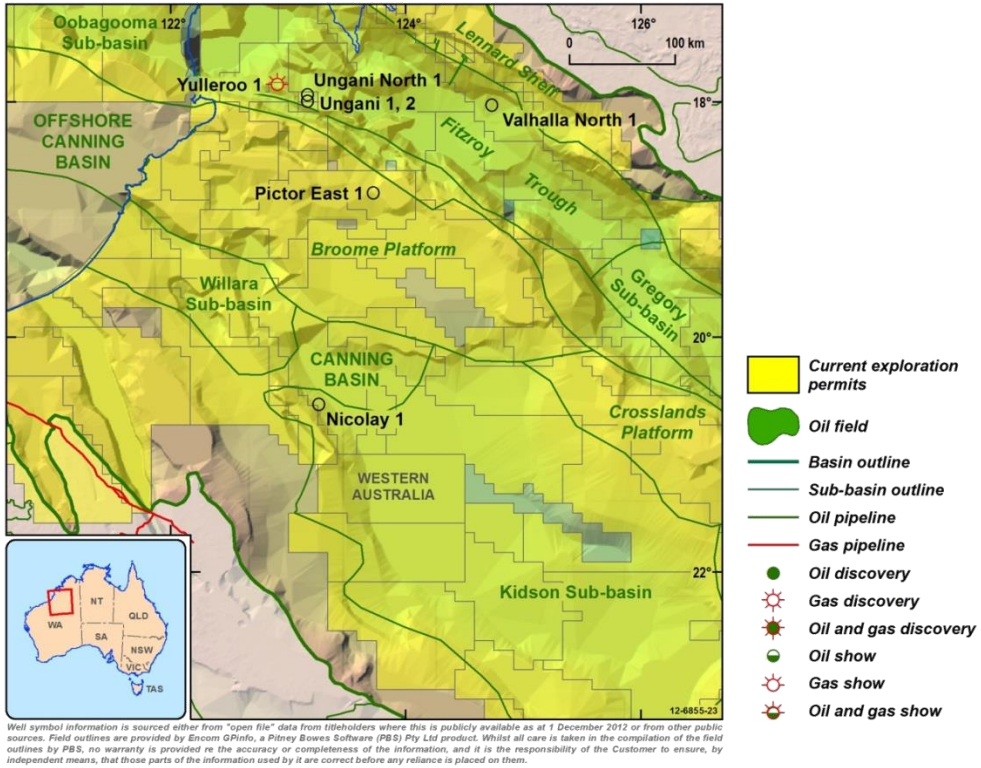
Hi s 22 ,
Can you send a copy of the Canning gas DAR to s 22 and me. I forgot to pick up a copy on Sunday and not sure of latest version…
Thanks

s 22

Geochemistry of gases in the Canning Basin

Dianne Edwards[1], Chris Boreham[1], Emma Grosjean[1], Arthur Mory[2], Jacob Sohn[1], Ziqing Hong[1], Neel Jinadasa, David Long[3] , Peter Edwards[3] ,

Fig. 1. Location of natural gas samples

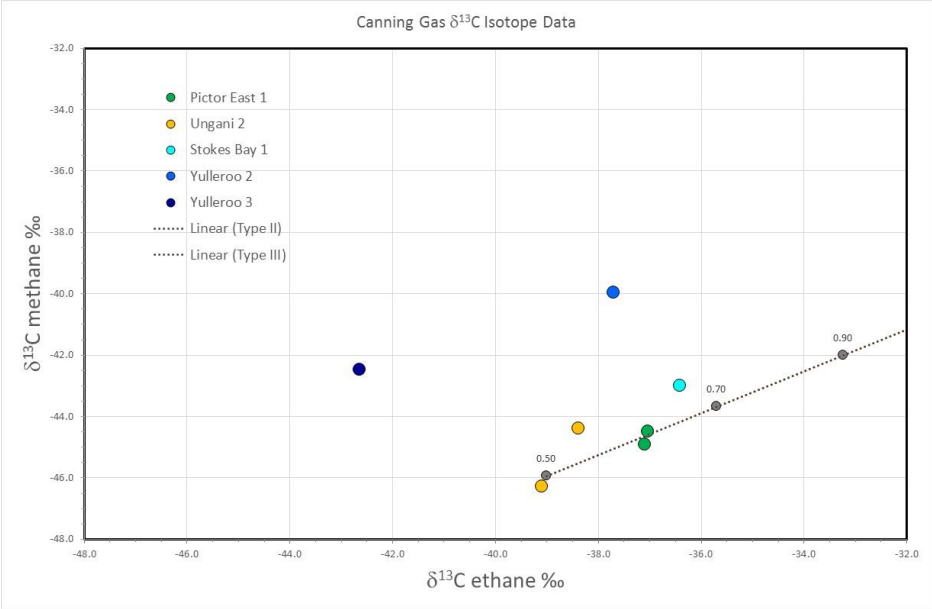


Well symbol information is sourced either from "open file" data from titleholders where this is publicly available as at 1 December 2012 or from other public sources. Field outlines are provided by Encom GPinfo, a Pitney Bowes Software (PBS) Pty Ltd product. Whilst all care is taken in the compilation of the field outlines by PBS, no warranty is provided re the accuracy or completeness of the information, and it is the responsibility of the Customer to ensure, by independent means, that those parts of the information used by it are correct before any reliance is placed on them.

Label sample location stokes Bay, Yulleroo 2, 3 Pictor East-1 + Mt Whelan gas samples

Sub kitted to s 22

Fig. 2a, 2b Gas Maturity



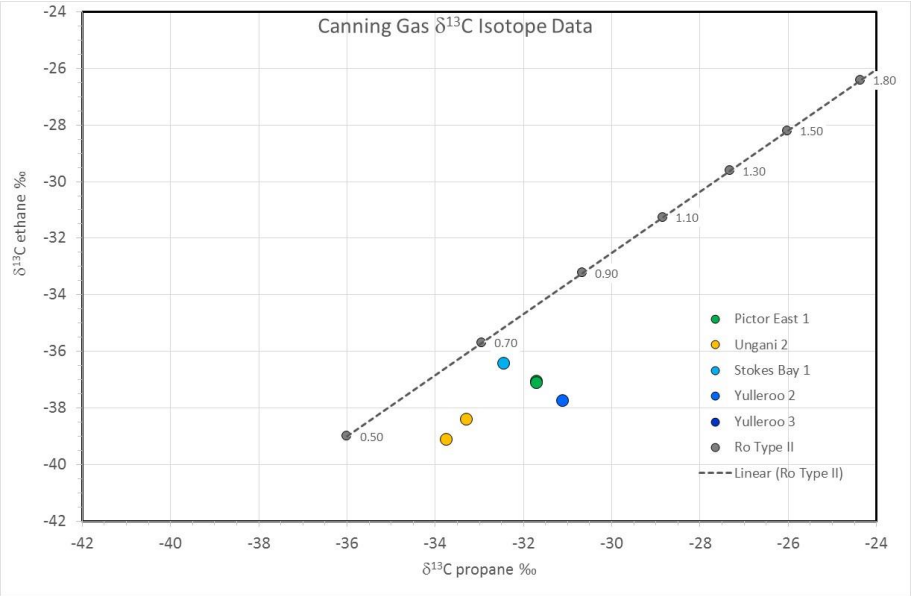


Fig 3a Gas Isotopic Composition

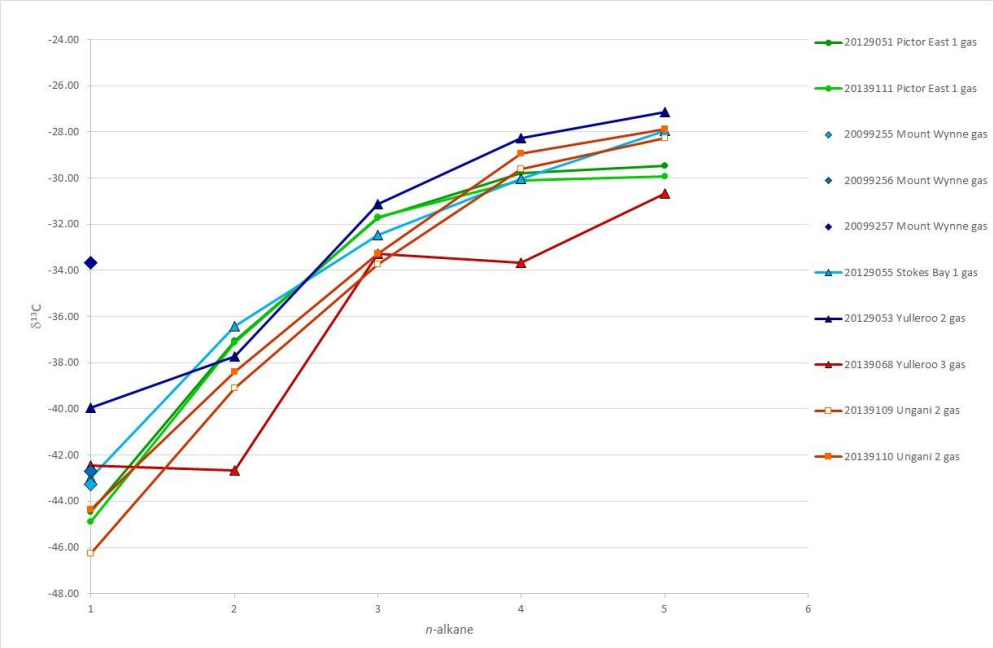


Fig 3b Gas- oil Correlation

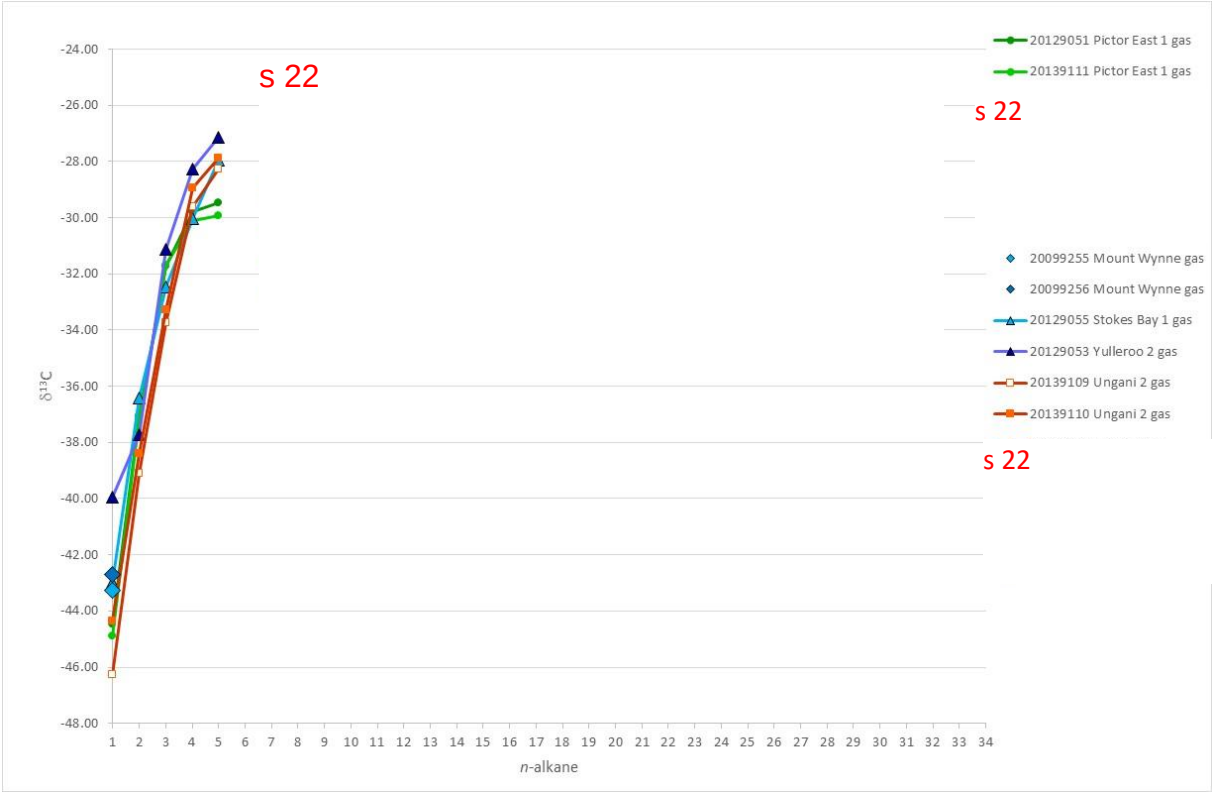
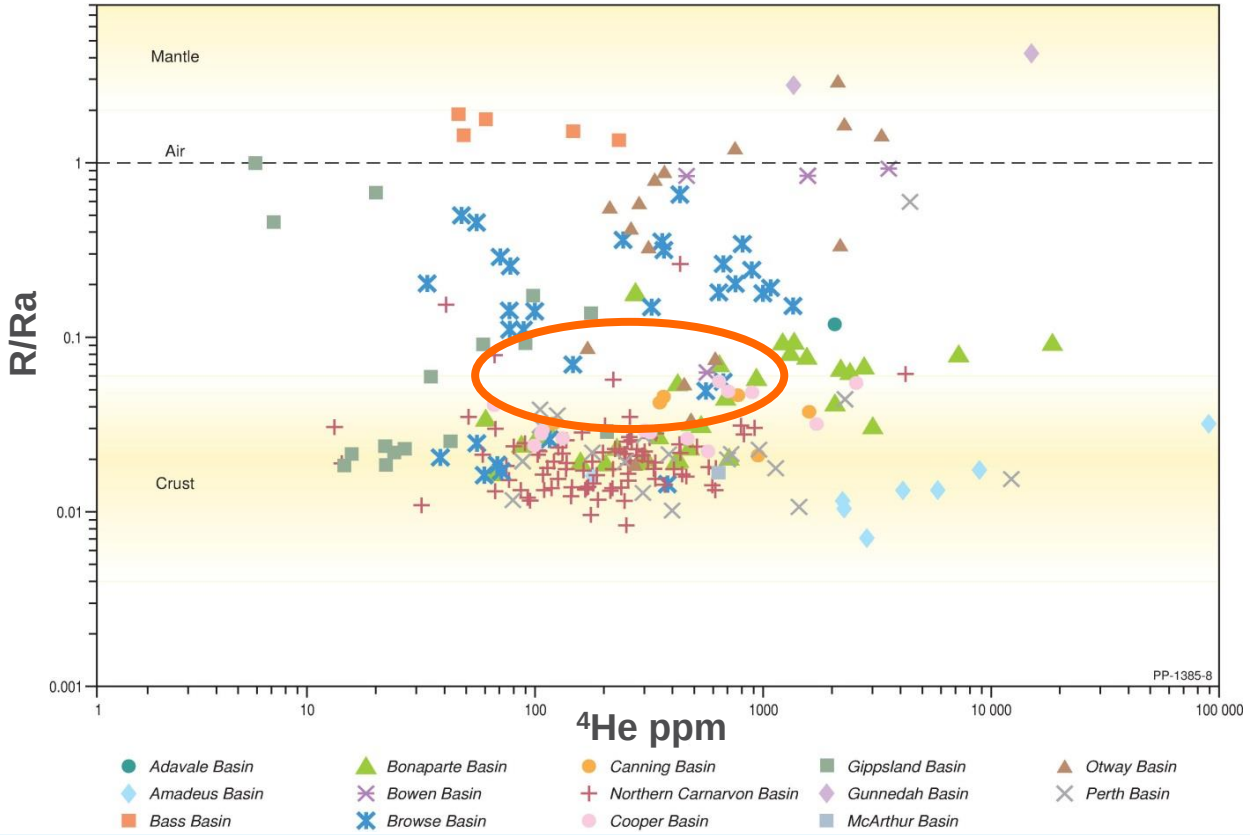


Fig. 4 Helium Isotopes in the Canning Basin



Boreham et al., 2017, APPEA J.

From: s 22
To: s 22
Cc: s 22
Subject: RE: EFTF gas figs suggestions [SEC=OFFICIAL]
Date: Monday, 9 December 2019 11:57:29 AM
Attachments: CanningGasPlotDataIsoC1C2vs3.xlsx
CSIA C Can gasoilvs1.xlsx
image001.png
image002.png
image003.png
image004.png
image005.png

Hi s 22
Here are the updated files,
Any suggestions welcome.
s 22, when I spoke briefly with s 22 on Friday he wanted to know origin of helium and nitrogen…obviously in Canning for this piece of work s 22

From: s 22 >
Sent: Monday, 9 December 2019 11:37 AM
To: s 22 >
Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]
I will have a look.
Cheers,
s 22
s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division
t s 22 www.ga.gov.au
16-9481 GA Email Signature_social media-04

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Subject: RE: DAR report gas; can you send please [SEC=OFFICIAL]

Hi s 22 ,

Attached.

Do I need to chase a map with s 22 ?

Cheers,

s 22
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Basin Systems | Minerals, Energy and Groundwater Division
t s 22 www.ga.gov.au

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Thanks

s 22

ust Oils ID.AGSO	ust Oils ID.Oracl	Well Name	Basin	Sub basin	Source	Air Content (%	CH_4	C_2	C_3
20129051	2129992	Pictor East 1	Canning		Ordo		72.19	10.13	4.78
20139111	2164990	Pictor East 1	Canning		Ordo	0.10	72.75	9.95	4.59
20099254	2000842	Mount Wynne	Canning		Carb?	0.32	44.62	0.02	0.00
20099255	2000843	Mount Wynne	Canning		Carb?	1.53	44.99	0.02	0.00
20099256	2000844	Mount Wynne	Canning		Carb?	2.65	46.59	0.03	0.00
20099257	2000845	Mount Wynne	Canning		Carb?	54.21	20.79	0.00	0.00
20099258	2000846	Mount Wynne	Canning		Carb?	63.86	6.04	0.00	0.00
20139109	2164988	Ungani 2	Canning		Dev-carb	4.48	59.03	5.49	2.44
20139110	2164989	Ungani 2	Canning		Dev-carb	2.66	58.76	5.15	2.30
20129055	2129996	Stokes Bay 1	Canning		Carb?		80.49	3.85	5.13
20129056	2129997	Stokes Bay 1	Canning		Carb?		80.02	3.79	4.97
20129053	2129994	Yulleroo 2	Canning		Carb?		78.72	5.96	3.40
20129054	2129995	Yulleroo 2	Canning		Carb?		82.05	7.55	3.41
20139068	2153879	Yulleroo 3	Canning		Carb?	0.08	83.00	8.02	2.90

S 22

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i-C_4	*n*-C_4	*neo*-C_5	*i*-C_5	*n*-C_6	Hexane (mol%)	C_{6+} (mol%)	C_{7+} (mol%)	SUM C1-C5	C_1/C_1-C_5	C_2/C_3
0.68	1.18	0.00	0.28	0.22		0.16		89.46	0.81	2.12
0.63	1.08	0.00	0.26	0.20		0.24		89.47	0.81	2.17
0.00	0.00	0.00	0.00	0.00		0.00		44.64	1.00	44.80
0.00	0.00	0.00	0.00	0.00		0.00		45.01	1.00	37.04
0.00	0.00	0.00	0.00	0.00		0.00		46.62	1.00	45.31
0.00	0.00	0.00	0.00	0.00		0.00		20.79	1.00	
0.00	0.00	0.00	0.00	0.00		0.00		6.04	1.00	
0.38	0.58	0.00	0.34	0.31		0.50		68.57	0.86	2.25
0.36	0.57	0.00	0.33	0.28		0.49		67.74	0.87	2.24
1.02	3.48	0.01	0.70	0.80		0.60		95.48	0.84	0.75
1.01	3.47	0.01	0.78	0.94		1.11		94.99	0.84	0.76
0.55	1.22	0.01	0.48	0.55		1.01		90.89	0.87	1.75
0.43	0.79	0.01	0.21	0.18		0.16		94.63	0.87	2.22
0.23	0.46	0.01	0.08	0.06		0.07		94.76	0.88	2.77

S 22

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Nitrogen (mol%)	CO_2 (mol%)	Helium (mol%)	Hydrogen (mol%)	H_2S (mol%)	O_2+Ar (mol%)	alyst (if not AG	Isotopes.AGS	CH4	C2	C3
9.75	0.10	0.54	0.00	? See lab 0 or ND			20129051	-44.47	-37.05	-31.71
9.68	0.08	0.52	0.00				20139111	-44.90	-37.11	-31.70
53.78	1.29	0.28	0.00							
53.50	1.28	0.21	0.00				20099255	-43.28		
51.87	1.32	0.19	0.00				20099256	-42.70		
78.94	0.16	0.11	0.00				20099257	-33.66		
93.70	0.20	0.05	0.00							
27.83	1.37	0.83	0.90				20139109	-46.25	-39.11	-33.75
27.96	2.72	1.01	0.08				20139110	-44.38	-38.39	-33.29
1.05	0.54	0.10	2.23				20129055	-42.97	-36.42	-32.46
1.02	0.55	0.10	2.23							
4.85	1.54	0.16	1.54				20129053	-39.95	-37.72	-31.12
4.32	0.57	0.11	0.21							
4.65	0.46	0.06	0.00				20139068	-42.45	-42.65	-33.28

S 22

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i-C4	n-C4	i-C5	n-C5	hexanes	as Isotopes.C0	neo-C5	sotopes.Comm	es deuterium	C1Methane	C2Ethane	C3Propane
-30.01	-29.77	-29.03	-29.47		-7.72	-31.71		20129051	-219.81	-194.47	-138.71
-30.69	-30.11	-29.41	-29.91			-32.21		20139111	-211.41	-189.41	-144.43
								20099254	-159.76		
					-16.63			20099255	-157.43		
					-16.50			20099256	-156.59		
					-7.70			20099257	-143.87		
-30.16	-29.61	-28.49	-28.26		-7.66	-29.77		20139109	-194.29	-225.40	-204.66
-30.78	-28.95	-27.95	-27.86		-7.02	-29.61		20139110	-190.41	-223.03	-201.66
-29.60	-30.04	-28.22	-27.95		-8.14	-32.65		20129055	-174.24	-198.19	-188.77
-27.40	-28.28	-26.84	-27.13		-8.22			20129053	-165.60	-224.02	-188.80
-35.40	-33.68	-34.05	-30.66		-8.12	-37.54		20139068	-153.80	-206.49	-173.90

S 22

s 22

s 22

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i-C4Butane	n-C4Butane	i-C5Pentane	n-C5Pentane	neo-C5Pentan	Methane std	Ethane std	Propane std	i-C4Butane std	n-C4Butane std	i-C5Pentane st	n-C5Pentane st	neo-C5Pentane stdev	Rig
-134.48	-118.61	-112.55	-129.36	-163.60	1.79	3.63	0.40	5.12	0.38	2.30	3.25	4.45	
-118.26	-130.61	-109.56	-124.82	-166.78	0.38	0.15	0.25	0.82	0.60	0.77	0.33	0.19	
					1.35	0.00	0.00	0.00	0.00	0.00	0.00		
					1.04	0.00	0.00	0.00	0.00	0.00	0.00		
					0.46	0.00	0.00	0.00	0.00	0.00	0.00		
					2.64	0.00	0.00	0.00	0.00	0.00	0.00		
-158.31	-168.49	-130.50	-136.14		0.38	0.27	0.35	0.87	2.82	0.88	0.62		
-154.87	-167.17	-130.71	-136.61		0.57	0.15	0.31	0.37	0.56	0.34	0.12		
-146.28	-176.00	-137.93	-157.46		2.61	3.99	1.46	0.40	2.66	0.44	2.14		
-147.56	-168.44	-139.53	-150.72		1.16	4.34	3.17	3.33	2.06	2.03	2.82		
-135.41	-154.68	-123.46	-134.90	-148.53	1.00	0.36	0.54	0.87	0.71	0.75	0.33	0.06	

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Release D	Latitude	Longitude	Group	Formation	Member/Un	Upper Depth	Lower Depth	Age	HC Test	Details of tes	ervoir press	er pressure	er Informat
2/09/2011	-18.7706	123.7259				0	0			Pressure 3		360psi	
2/09/2011						0	0			0879/TS12		1400 psi	
						0	0			#198431, M			
						0	0			#198431, M			
						0	0			#198431, M			
						0	0			#198431, M			
						0	0			#198431, M			
18/10/2011	-17.9904	123.1641				0	0			S#2 Sampl		low pressu	
18/10/2011	-17.9904	123.1641				0	0			S#4 Sampl		low pressu	
5 Nov 2007	-17.1399	123.7090				0	0			Well gas sa		120psi	
5 Nov 2007	-17.1399	123.7090				0	0			Gas sampl		120psi	
10/05/2008	-17.8601	122.9331				0	0			Sampled fr		25psi	
10/05/2008	-17.8601	122.9331				0	0			Sampled fr		400psi	
25/05/2012	spud date					3200	0			2012-024, A		400 psi	

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ils ID.Samp	hysical Stat	Colour	ype contain	Bottle mL	remaining	ID/ No (if ap	oom Sub-sa	Date Lodged	roduct outp	onfidentialit	IP	GSO conta
Gas	Cylinder							28-Mar-12		UNCO		s 22
Gas	Cylinder							23-Jul-13		Special Stu		
Gas	Gas bag							31-Aug-09				
Gas	Gas bag							31-Aug-09				
Gas	Gas bag							31-Aug-09				
Gas	Gas bottle							31-Aug-09				
Gas	Gas bottle							31-Aug-09				
Gas	Cylinder							23-Jul-13		Special Stu		
Gas	Cylinder							23-Jul-13		Special Stu		
Gas	Cylinder							02-Apr-12		UNCO		
Gas	Cylinder							02-Apr-12		UNCO		
Gas	Cylinder							02-Apr-12		UNCO		
Gas	Cylinder							02-Apr-12		UNCO		
Gas	Cylinder							03-Apr-13		Onshore H		

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Source of sample	pository Ba	port referer	Field0	Field1	Field2	mposition.A	position.Ana	mposition..
Buru Energy		He May 14	Canning		Gas	20129051	2012-March	
Buru Energy		He March 1	Canning		Gas	20139111		
WA Survey			Canning		Gas	20099254	2009-Sept	
WA Survey			Canning		Gas	20099255	2009-Sept	
WA Survey			Canning		Gas	20099256	2009-Sept	
WA Survey			Canning		Gas	20099257	2009-Sept	
WA Survey			Canning		Gas	20099258	2009-Sept	
Buru Energy		low pressu	Canning		Gas	20139109		
Buru Energy		low p; cylin	Canning		Gas	20139110		
Buru Energy		He May 14	Canning		Gas	20129055	2012-April	
Buru Energy		He May 14	Canning		Gas	20129056	2012-April	
Buru Energy			Canning		Gas	20129053	2012-April	
Buru Energy		He May 14	Canning		Gas	20129054	2012-April	
Buru Energy		He March 1	Canning		Gas	20139068		

s 22

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s 22

s 22

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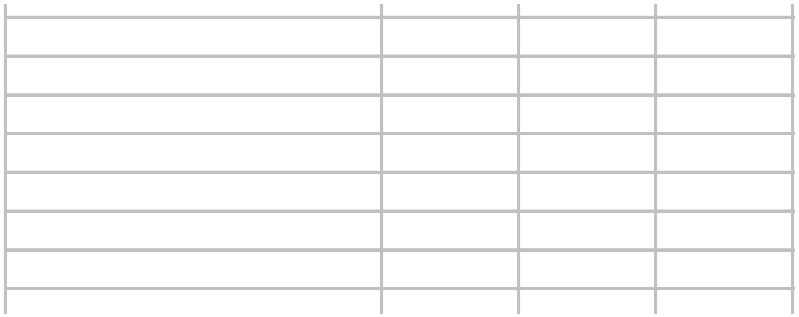
Gas Composition.Oracle?	cylinder no	eotech File	nposition.Comments
Updated in 2014 with corrected			Normal; PSLA
Updated in 2014 with corrected			
Updated in 2014 with corrected			manual 3
Updated in 2014 with corrected			manual 3
Updated in 2014 with corrected			manual 3
Updated in 2014 with corrected			manual 3
Updated in 2014 with corrected			manual 3
Updated in 2014 with corrected			
Updated in 2014 with corrected			
Updated in 2014 with corrected			PSLA
Updated in 2014 with corrected			PSLA
Updated in 2014 with corrected			PSLA
Updated in 2014 with corrected			PSLA
Updated in 2014 with corrected			

s 22



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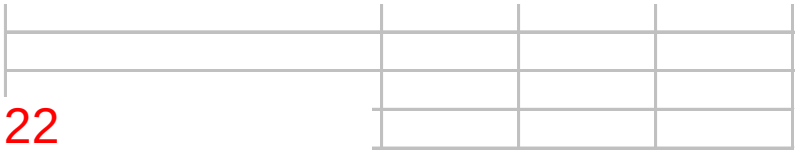

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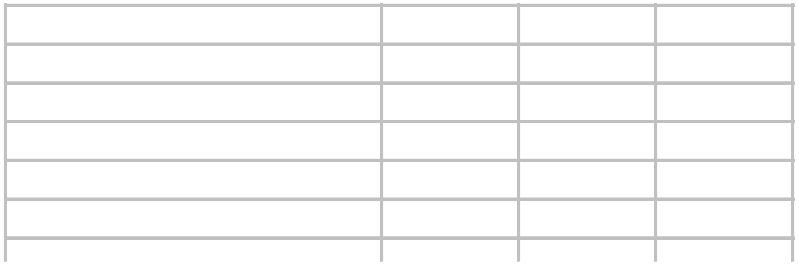

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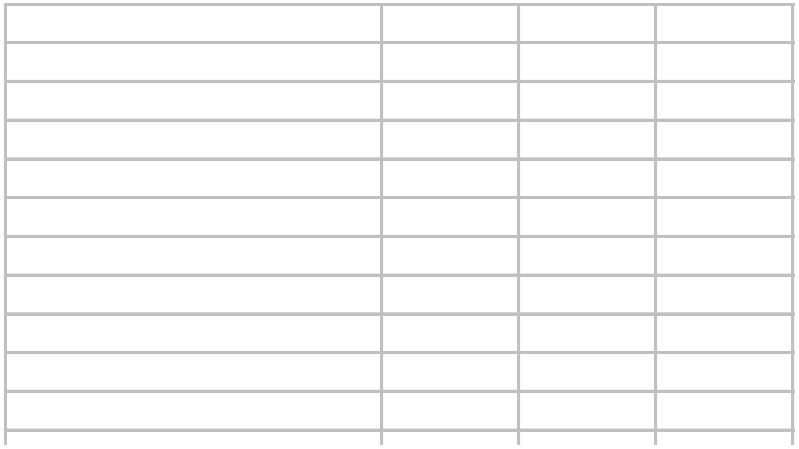

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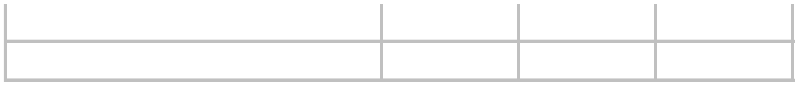

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ust Oils ID.AGSO	ust Oils ID.Oracl	Well Name	Basin	Sub basin	C3
20129051	2129992	Pictor East 1	Canning		-31.71
20139111	2164990	Pictor East 1	Canning		-31.70
20099254	2000842	Mount Wynne	Canning		
20099255	2000843	Mount Wynne	Canning		
20099256	2000844	Mount Wynne	Canning		
20099257	2000845	Mount Wynne	Canning		
20099258	2000846	Mount Wynne	Canning		
20139109	2164988	Ungani 2	Canning		-33.75
20139110	2164989	Ungani 2	Canning		-33.29
20129055	2129996	Stokes Bay 1	Canning		-32.46
20129056	2129997	Stokes Bay 1	Canning		
20129053	2129994	Yulleroo 2	Canning		-31.12
20129054	2129995	Yulleroo 2	Canning		
20139068	2153879	Yulleroo 3	Canning		-33.28

s 22

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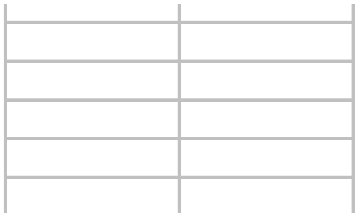
s 22

C2	CH4
-37.05	-44.47
-37.11	-44.90
	-43.28
	-42.70
	-33.66
-39.11	-46.25
-38.39	-44.38
-36.42	-42.97
-37.72	-39.95
-42.65	-42.45

s 22

s 22

s 22



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Well	Ro	RoC3 TII(20)	Ro Type II	Ro C2 TII(19)
Plot C3 vs C2	0.50	-36.0	-39.0	
	0.70	-32.9	-35.7	
	0.90	-30.7	-33.2	
	1.10	-28.8	-31.3	
	1.30	-27.3	-29.6	
	1.50	-26.0	-28.2	
	1.80	-24.4	-26.4	
	2.00	-23.4	-25.4	
	2.50	-21.4	-23.2	
	3.00	-19.7	-21.4	

Plot C2 vs C1

Ro	RoC2 TII(19)	Ro Type II	RoC1TII(18)
0.50	-39.0	-45.9	
0.70	-35.7	-43.7	
0.90	-33.2	-42.0	
1.10	-31.3	-40.7	
1.30	-29.6	-39.5	
1.50	-28.2	-38.6	
1.80	-26.4	-37.4	
2.00	-25.4	-36.7	
2.50	-23.2	-35.2	
3.00	-21.4	-34.0	

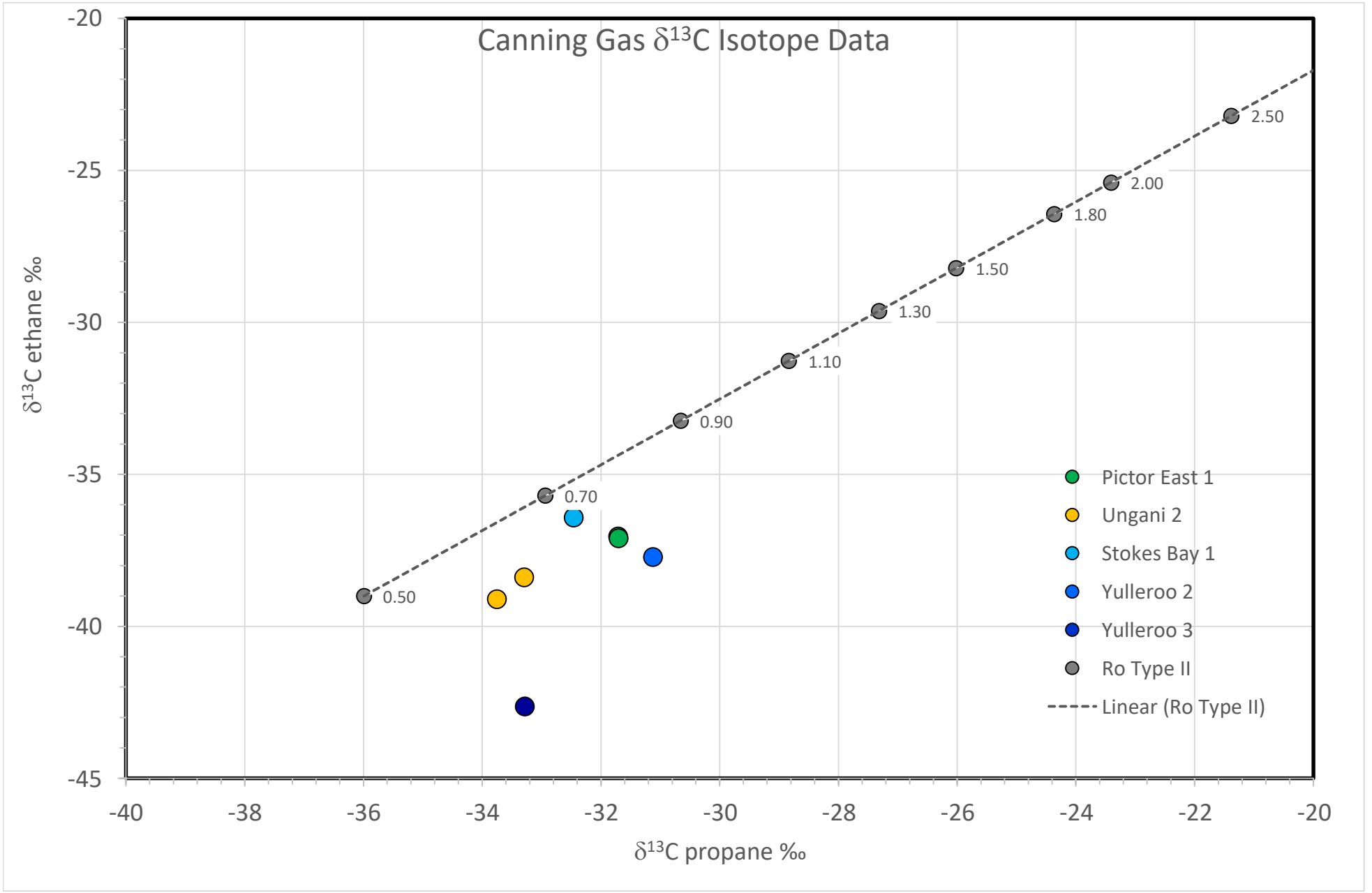
Ro		Ro Type III
0.5	-24.2	-29.7
0.7	-23.6	-29.1
0.9	-22.9	-28.5
1.1	-22.2	-27.9
1.3	-21.6	-27.3
1.5	-20.9	-26.7
1.8	-19.9	-25.8
2	-19.3	-25.2
2.5	-17.6	-23.7
3	-15.9	-22.2

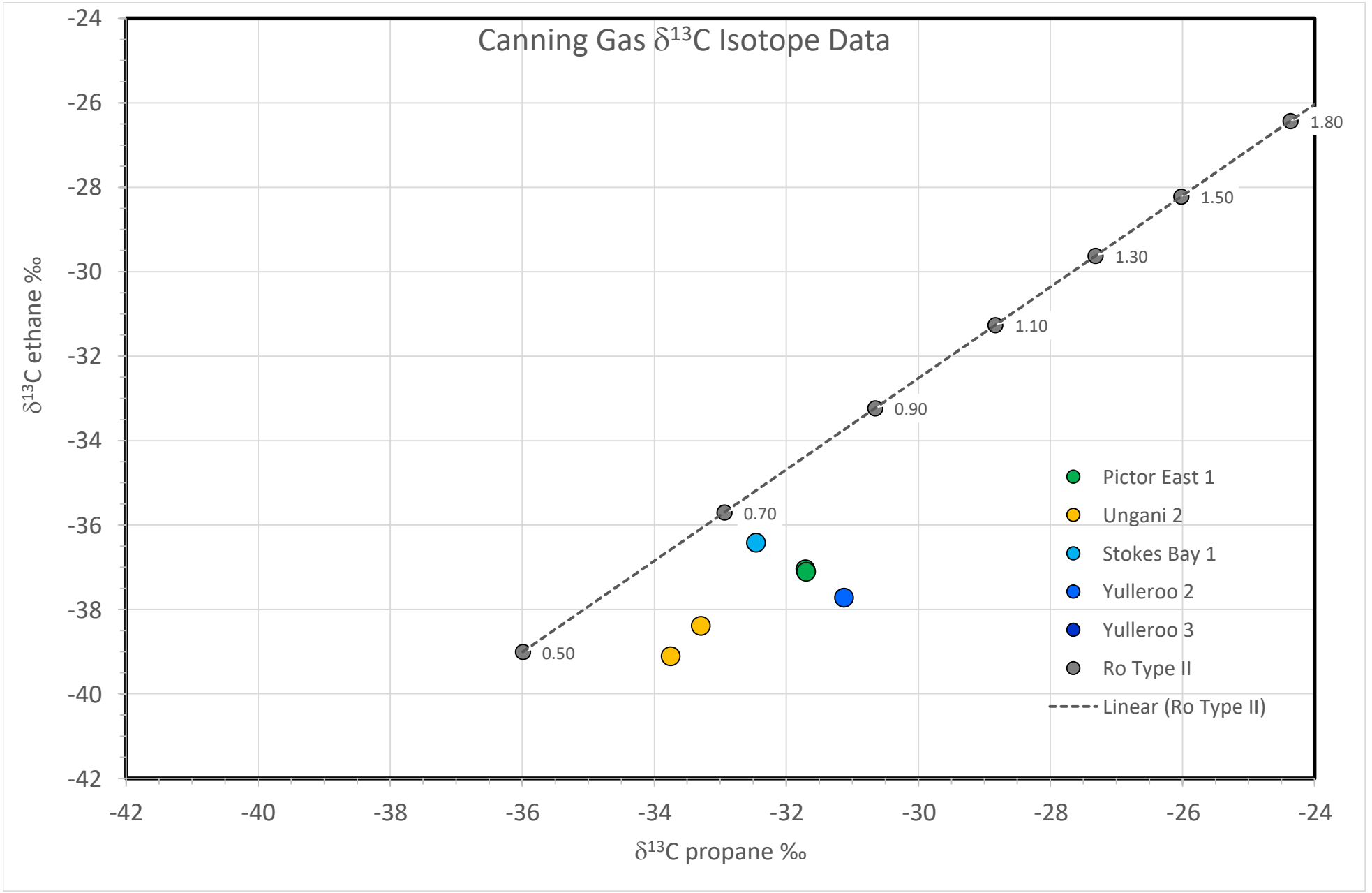
calculations

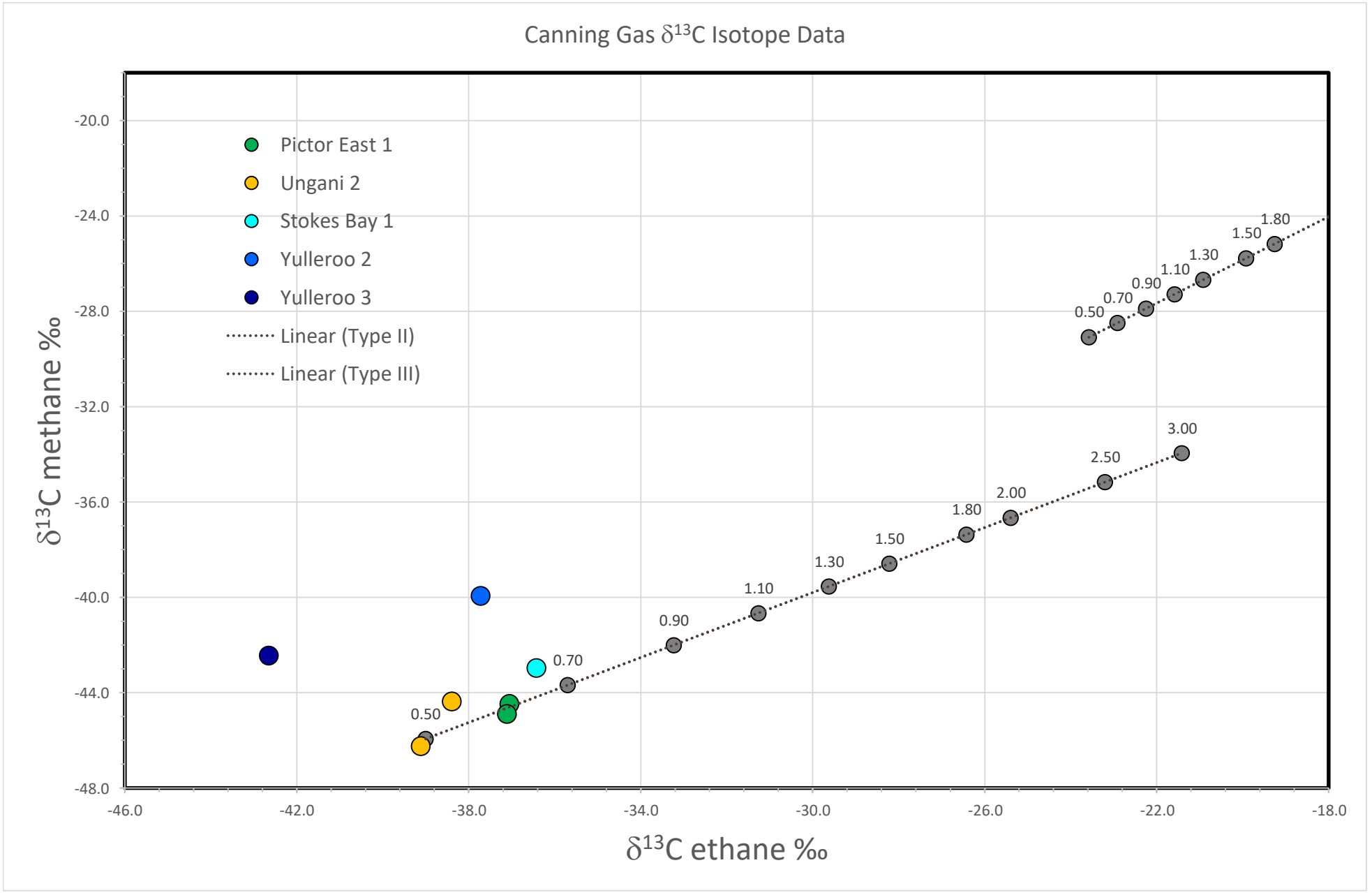
Ro	RoC3 TII(20)	RoC2 TII(19)	RoC1TII(18)	RoC2 TII(24)
0.5	-36.0	-39.0	-45.9	-24.2
0.7	-32.9	-35.7	-43.7	-23.6
0.9	-30.7	-33.2	-42.0	-22.9
1.1	-28.8	-31.3	-40.7	-22.2
1.3	-27.3	-29.6	-39.5	-21.6
1.5	-26.0	-28.2	-38.6	-20.9
1.8	-24.4	-26.4	-37.4	-19.9
2	-23.4	-25.4	-36.7	-19.3
2.5	-21.4	-23.2	-35.2	-17.6
3	-19.7	-21.4	-34.0	-15.9

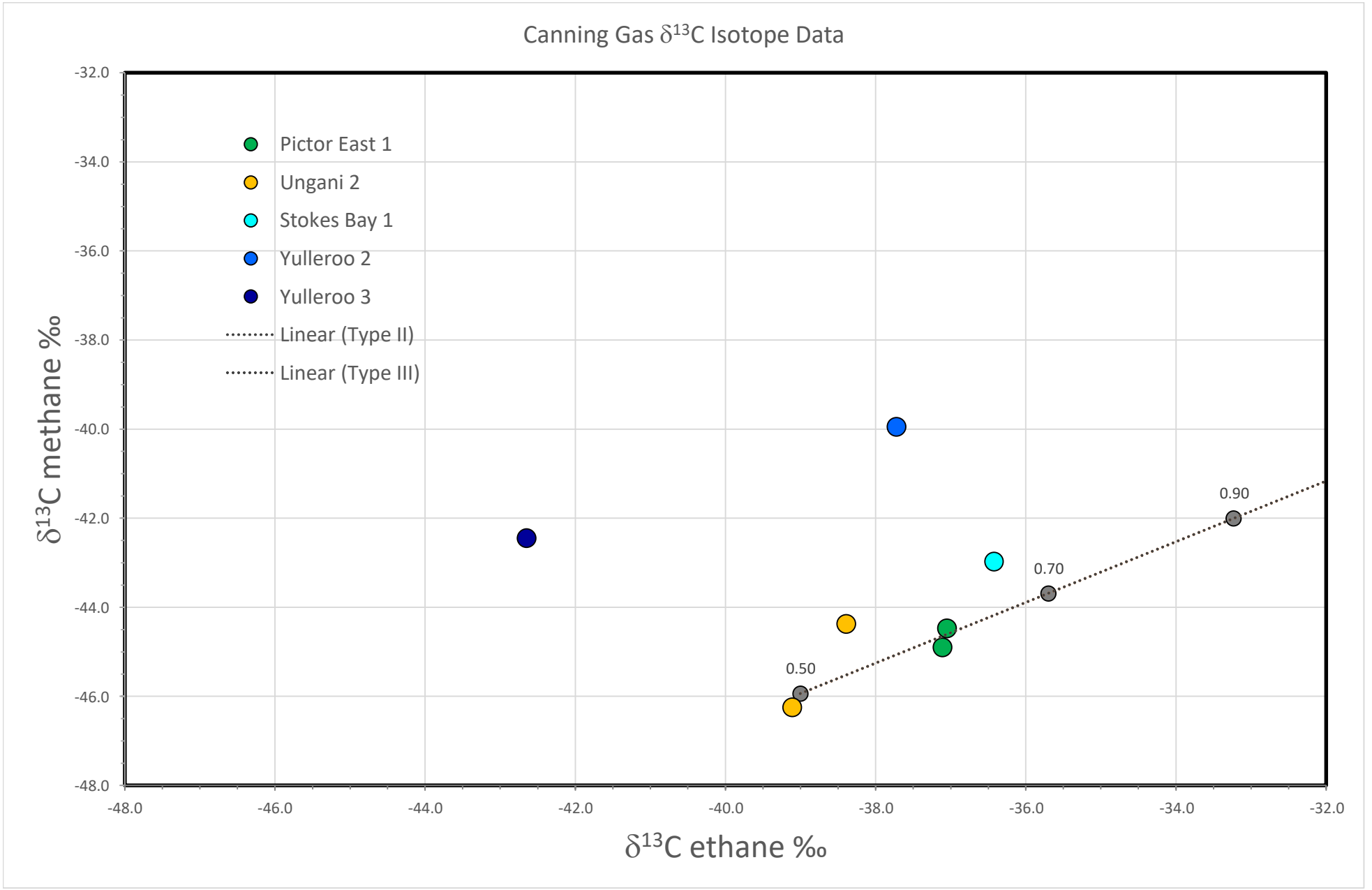
Type III		
0.5	-24.2	-29.7
0.7	-23.6	-29.1
0.9	-22.9	-28.5
1.1	-22.2	-27.9
1.3	-21.6	-27.3
1.5	-20.9	-26.7
1.8	-19.9	-25.8
2	-19.3	-25.2
2.5	-17.6	-23.7
3	-15.9	-22.2

RoC1 TIII(23)	RoC1 TIII(25)
-29.7	-35.4
-29.1	-34.1
-28.5	-33.2
-27.9	-32.4
-27.3	-31.8
-26.7	-31.3
-25.8	-30.6
-25.2	-30.2
-23.7	-29.4
-22.2	-28.7


Canning Gas δ13C Isotope Data
δ13C ethane ‰
δ13C propane ‰
-20
-25
-30
-35
-40
-45
-40
-38
-36
-34
-32
-30
-28
-26
-24
-22
-20
0.50
0.70
0.90
1.10
1.30
1.50
1.80
2.00
2.50
Pictor East 1
Ungani 2
Stokes Bay 1
Yulleroo 2
Yulleroo 3
Ro Type II
Linear (Ro Type II)


Canning Gas δ13C Isotope Data
δ13C ethane ‰
δ13C propane ‰
-24
-26
-28
-30
-32
-34
-36
-38
-40
-42
-42
-40
-38
-36
-34
-32
-30
-28
-26
-24
0.50
0.70
0.90
1.10
1.30
1.50
1.80
Pictor East 1
Ungani 2
Stokes Bay 1
Yulleroo 2
Yulleroo 3
Ro Type II
Linear (Ro Type II)


Canning Gas δ13C Isotope Data
Pictor East 1
Ungani 2
Stokes Bay 1
Yulleroo 2
Yulleroo 3
Linear (Type II)
Linear (Type III)
δ13C methane ‰
δ13C ethane ‰
-20.0
-24.0
-28.0
-32.0
-36.0
-40.0
-44.0
-48.0
-46.0
-42.0
-38.0
-34.0
-30.0
-26.0
-22.0
-18.0
0.50
0.70
0.90
1.10
1.30
1.50
1.80
2.00
2.50
3.00


Canning Gas δ13C Isotope Data
Pictor East 1
Ungani 2
Stokes Bay 1
Yulleroo 2
Yulleroo 3
Linear (Type II)
Linear (Type III)
0.50
0.70
0.90
δ13C methane ‰
δ13C ethane ‰
-32.0
-34.0
-36.0
-38.0
-40.0
-42.0
-44.0
-46.0
-48.0

s 22 - pages 2 to 58 removed from document under section 22 - irrelevant material

SampleNo	SampleID	Well Name	CH4	C2	C3	i-C4
Canning Basin						
20129051	2129992	Pictor East 1	-44.47	-37.05	-31.71	-30.01
20139111	2164990	Pictor East 1	-44.90	-37.11	-31.70	-30.69
20099254	2000842	Mount Wynne seep				
20099255	2000843	Mount Wynne seep	-43.28			
20099256	2000844	Mount Wynne seep	-42.70			
20099257	2000845	Mount Wynne seep	-33.66			
20099258	2000846	Mount Wynne seep				
20139109	2164988	Ungani 2	-46.25	-39.11	-33.75	-30.16
20139110	2164989	Ungani 2	-44.38	-38.39	-33.29	-30.78
20129055	2129996	Stokes Bay 1	-42.97	-36.42	-32.46	-29.60
20129056	2129997	Stokes Bay 1				
20129053	2129994	Yulleroo 2	-39.95	-37.72	-31.12	-27.40
20129054	2129995	Yulleroo 2				
20139068	2153879	Yulleroo 3	-42.45	-42.65	-33.28	-35.40

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n-C4	i-C5	n-C5	hexanes	CO2	neo-C5	otopes.Com	CH4 stdev	C2 stdev
-29.77	-29.03	-29.47		-7.72	-31.71		0.13	0.02
-30.11	-29.41	-29.91			-32.21		0.15	0.02
				-16.63			0.03	
				-16.50			0.07	
				-7.70			0.11	
-29.61	-28.49	-28.26		-7.66	-29.77		0.08	0.17
-28.95	-27.95	-27.86		-7.02	-29.61		0.35	0.02
-30.04	-28.22	-27.95		-8.14	-32.65		0.25	0.02
-28.28	-26.84	-27.13		-8.22			0.15	0.00
-33.68	-34.05	-30.66		-8.12	-37.54		0.18	0.12

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C3 stdev	i-C4 stdev	C4 stdev	i-C5 stdev	n-C5 stdev	exanes stde	CO2 stdev	neo-C5 stde	es deuterium
0.01	0.07	0.04	0.23	0.06		0.11	0.10	20129051
0.04	0.23	0.17	0.11	0.03			0.11	20139111
								20099254
						0.25		20099255
						0.11		20099256
						0.37		20099257
0.07	0.00	0.01	0.17	0.01		0.06	0.24	20139109
0.06	0.04	0.17	0.02	0.02		0.07	0.16	20139110
0.06	0.11	0.21	0.04	0.02		0.24	0.21	20129055
0.02	0.12	0.08	0.28	0.02		0.04		20129053
0.01	0.23	0.14	0.09	0.09		0.20	0.42	20139068

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deuterium..	pes deuteri	pes deuteri	us deuterium	C1Methane	C2Ethane	C3Propane	i-C4Butane	n-C4Butane
				-219.81	-194.47	-138.71	-134.48	-118.61
14-Jul-14	31283			-211.41	-189.41	-144.43	-118.26	-130.61
				-159.76				
				-157.43				
				-156.59				
				-143.87				
14-Jul-14	31283			-194.29	-225.40	-204.66	-158.31	-168.49
15-Jul-14	31283			-190.41	-223.03	-201.66	-154.87	-167.17
				-174.24	-198.19	-188.77	-146.28	-176.00
				-165.60	-224.02	-188.80	-147.56	-168.44
10-Jul-14	31283			-153.80	-206.49	-173.90	-135.41	-154.68

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-C5Pentane	-C5Pentane	eo-C5Pentane
-112.55	-129.36	-163.60
-109.56	-124.82	-166.78

-130.50	-136.14	
-130.71	-136.61	
-137.93	-157.46	

-139.53	-150.72	
-123.46	-134.90	-148.53

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*Aust Oils	*Aust Oils	Well Name	Name	Name
g Basin Ordovician				
20129051	2129992	Pictor East 1	20129051 Pictor East 1	20129051 Pictor East 1 gas
20139111	2164990	Pictor East 1	20139111 Pictor East 1	20139111 Pictor East 1 gas

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Basin Carboniferous				
20099255	2000843	Mount Wynne	20099255 Mount Wynne	20099255 Mount Wynne gas
20099256	2000844	Mount Wynne	20099256 Mount Wynne	20099256 Mount Wynne gas
20099257	2000845	Mount Wynne	20099257 Mount Wynne	20099257 Mount Wynne gas

s 22

20129055	2129996	Stokes Bay 1	20129055 Stokes Bay 1	20129055 Stokes Bay 1 gas
20129053	2129994	Yulleroo 2	20129053 Yulleroo 2	20129053 Yulleroo 2 gas
20139068	2153879	Yulleroo 3	20139068 Yulleroo 3	20139068 Yulleroo 3 gas
20139109	2164988	Ungani 2	20139109 Ungani 2	20139109 Ungani 2 gas
20139110	2164989	Ungani 2	20139110 Ungani 2	20139110 Ungani 2 gas

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1	2	3	4	5	s			
-44.47	-37.05	-31.71	-29.77	-29.47				
-44.90	-37.11	-31.70	-30.11	-29.91				

s 22

-43.28
-42.70
-33.66

s 22

-42.97	-36.42	-32.46	-30.04	-27.95
-39.95	-37.72	-31.12	-28.28	-27.13
-42.45	-42.65	-33.28	-33.68	-30.66
-46.25	-39.11	-33.75	-29.61	-28.26
-44.38	-38.39	-33.29	-28.95	-27.86

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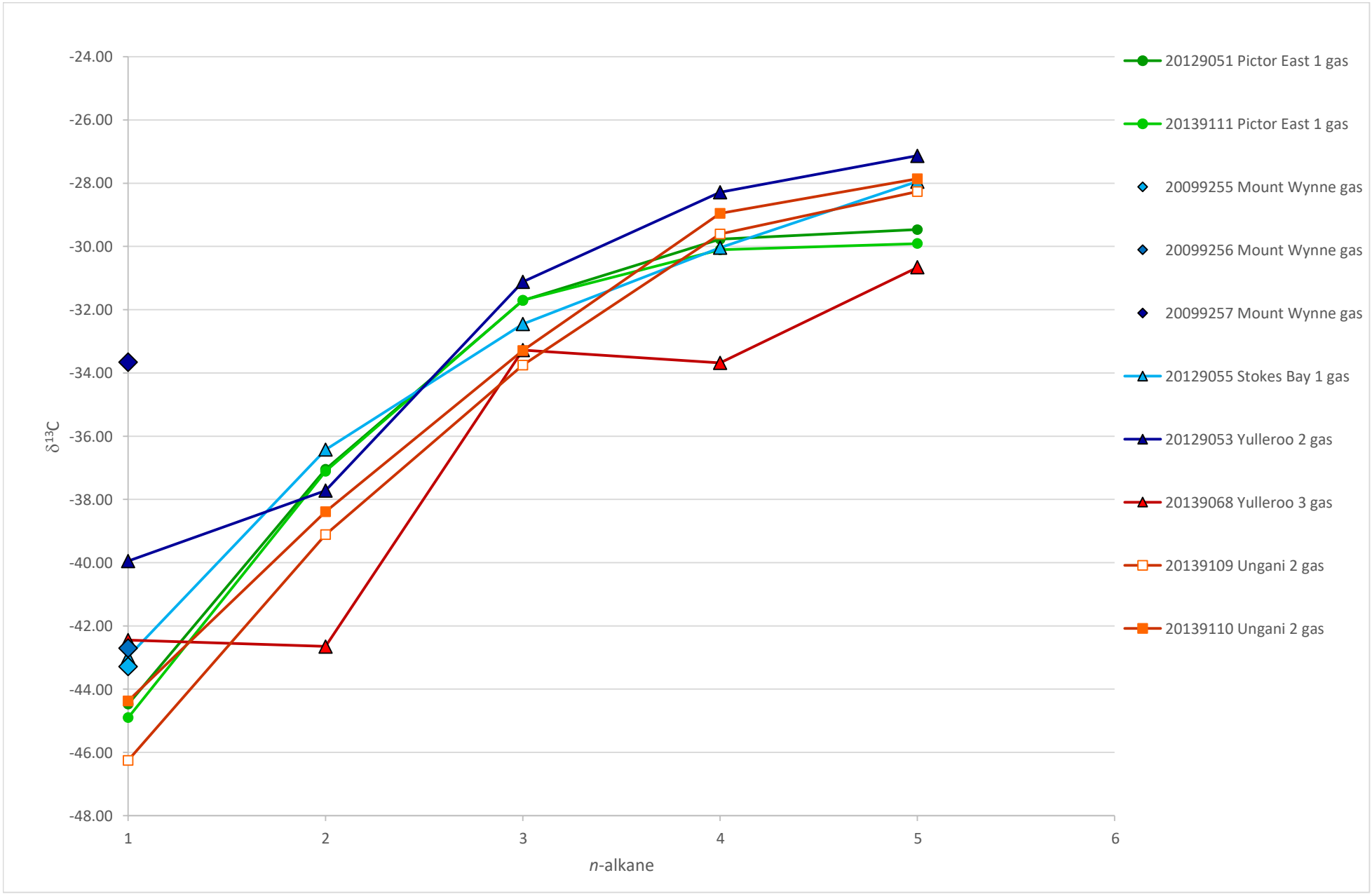
-24.00
-26.00
-28.00
-30.00
-32.00
-34.00
-36.00
-38.00
-40.00
-42.00
-44.00
-46.00
-48.00
δ13C
1
2
3
4
5
6
n-alkane
20129051 Pictor East 1 gas
20139111 Pictor East 1 gas
20099255 Mount Wynne gas
20099256 Mount Wynne gas
20099257 Mount Wynne gas
20129055 Stokes Bay 1 gas
20129053 Yulleroo 2 gas
20139068 Yulleroo 3 gas
20139109 Ungani 2 gas
20139110 Ungani 2 gas

s 22

From: s 22 @ga.gov.au>
Sent: Thursday, 13 February 2020 5:23 PM
To: s 22
Cc:
Subject: RE: Mount Wynne seep [SEC=OFFICIAL]

Thanks, s 22 ! Another excerpt below mentions gas bubbles and hydrocarbons too.

YEAR BOOK

OF THE

COMMONWEALTH OF AUSTRALIA.

No. 16.—1923.

824 CHAPTER XXI.—MINERAL INDUSTRY.

(v) *Western Australia.* In this State the chief interest in the search for oil centres in the Kimberley division. At Mount Wynne, in West Kimberley, the gas which bubbles freely in a hot spring has been found to contain hydrocarbons. Indications of free petroleum have been obtained in bores on Price's Creek, about 100 miles south-east of Mount Wynne, and traces of mineral oil have been detected in a seepage. In East Kimberley a black bitumen, residual from an asphaltic oil, has been found in weathered basalt in two localities five miles apart, thus indicating the former circulation of petroleum in the area. Private prospectors reported the occurrence of petroleum in bores put down on the Upper Fitzgerald River on the south coast, but official investigation proved the supposed indications to be misleading.

Cheers,

s 22

s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division

t s 22 www.ga.gov.au

GEOSCIENCE AUSTRALIA
APPLYING GEOSCIENCE TO AUSTRALIA'S MOST IMPORTANT CHALLENGES

Geoscience Australia acknowledges the Traditional Custodians of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islanders Cultures; and to elders past, present and emerging.

From: s 22 @dmirs.wa.gov.au>
Sent: Thursday, 13 February 2020 5:01 PM
To: s 22 @ga.gov.au>
Cc: s 22 @ga.gov.au>
Subject: RE: Mount Wynne seep [SEC=OFFICIAL]

Hello s 22
Garfias VR (1923, Petroleum of the World, John Wiley & Sons — Australian chapter extract below is hilarious) mentions Mount Wynne. I assume that this was discovered by Torrington Blatchford as his Kimberley oil field note book spans 1921–1925 and those old publications took years to prepare; however, I would have to look at that notebook to verify the assumption.
I collected the Mt Wynne seep from the hot spring at 18° 06' 15”S 124° 28' 06"E following instructions (and using the basic equipment) provided by s 22 on two occasions. I’m certain s 22 has the dates recorded.
Cheers
s 22

AUSTRALIA

INTRODUCTION

Australia is the largest island in the world, with an area of 3,000,000 square miles and a population of about 5,000,000. It forms the Commonwealth of Australia, which includes the colonies of New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania. The transportation and communication facilities include about 23,000 miles of Government-owned railway and many miles of telegraph and telephone lines.

The Commonwealth is a British Territory, with executive power vested in a Governor General appointed by the King, and legislative power vested in a representative Parliament. Prior to the War, Government revenues exceeded expenditures; the accumulated surplus at the end of 1922 was about $15,000,000, which offsets an estimated budget deficit of $12,000,000. The National Debt is estimated at about $1,956,000,000.

AUSTRALIA

147

Australia leads the world in wool production. Sheep and cattle raising and agriculture are the leading industries; wheat, oats, maize, barley, hay, and potatoes are the chief products. Exports go chiefly to Great Britain, the United States, and New Zealand, and include wheat and wool. Imports, including cotton piece goods and other textiles, metal manufacturers, and machines, come from Great Britain and the United States.

PETROLEUM RESOURCES

Oil indications are reported in the northern part of Western Australia near Mount Wynne in the Kimberley District, in the southwestern part near the confluence of the Warren and Donnelly Rivers near Cape Leeuwin; in the southeastern part of South Australia at Gawler near Adelaide, along Salt Creek near Meningie, at Bordertown, along the Coorong Lagoon, and on Kangaroo Island; in the southeastern part of Queensland, near Duaringa and Beaudesert (gas is also found near Ronna); in Victoria northwest of Melbourne at Bridgewater, along the coast at Portland, Western Port, and Cape Patterson; and in the northwestern part of Tasmania in the Inglis and Don Valleys.

The oil shales of New South Wales are located along the coast from Twofold Bay to Jervis Bay, and farther north and inland at Coonamble and at Gunnedah. They are reported to be among the richest in the world. Prospecting is going on, but no development work of commercial value has been done.

```
PETROLEUM LEGISLATION


Each Colony in Australia has its own mining legislation. In
general, these laws provide that only British subjects may receive
exploration or exploitation rights, for a period exceeding five years,
without the written consent of the Attorney General.
```

From: s 22 @ga.gov.au>
Sent: Thursday, 13 February 2020 12:14 PM
To: s 22 @ga.gov.au>; s 22 @dmirs.wa.gov.au>
Subject: Mount Wynne seep [SEC=OFFICIAL]

Hi s 22 and s 22 ,

I got feedback from Buru Energy on gas sample depths so I can focus on finishing off this DAR on the raw geochemical data of the Canning Basin gases.

I would need the latitude and longitude of the Mount Wynne seep gas sample. Do you know them or let me know where I can get them?
Not sure Blatchford was the first one to note this gas seep (maybe as the first geologist) as it was reported in the Official Year Book of the Commonwealth of Australia No. 16 – 1923 and every official year book after that.
Any vague idea on how these gas seep samples were sampled?

Cheers,

s 22

s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division

t s 22 www.ga.gov.au

Geoscience Australia acknowledges the Traditional Custodians of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islanders Cultures; and to elders past, present and emerging.

From: s 22
To: s 22
Cc: s 22
Subject: RE: Mount Wynne seep [SEC=OFFICIAL]
Date: Thursday, 27 February 2020 8:21:43 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

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s 22
As far as I can tell Torrington Blatchford visited the Mount Wynne area at least as early as 9/9/1921 but with almost no detail provided in his notebook. I suspect there may have been other notebooks that were not kept by GSWA.
The following is from pages 3–4 of the 'wcr' compiled by L.M. Waterford, who was the field superintendent in 1939–41. I assume the extract is from GSWA files, but have no idea who wrote it.
The spring was used as the water supply for the drilling. There is the remains of a boiler there and early maps show a pipeline from the spring to the well.
Cheers
s 22

In the meantime, attention had been directed to the Mount Wynne area, presumably on account of gas emanations from a hot spring in that locality. This spring is said to have commenced running in 1888, at the time of considerable volcanic disturbances in Java. I can find no satisfactory confirmation of this. At least three samples of the gas have been analysed, with conflicting results.
H. Bowley (Asst. Govt. Mineralogist and Chemist) states, in Assay Certificate G.S.L. No. 21/312 dated 9th April, 1921, that in addition to methane the paraffins present contain some of the higher members of the saturated hydrocarbon series. The sample submitted by Blatchford to Dr. Simpson, quoted in G.S. Bulletin No: 93, did not contain any of the higher homologues. (It is suggested that a further sample. might be collected next year* - L.M.W.)

Messrs. Blatchford and Talbot carried out a more or less detailed geological survey of the Mt. Wynne locality early in 1922, vide plate 4, G.S. Bulletin No. 93. A bore site was selected by Blatchford and drilling operations commenced in June, 1922.

*I assume this means 1942 given it's a note by Waterford.

From: s 22
Sent: Thursday, 13 February 2020 2:01 PM
To: s 22 @ga.gov.au>
Cc: s 22 @ga.gov.au
Subject: RE: Mount Wynne seep [SEC=OFFICIAL]

Hello s 22 ,
Garfias VR (1923, Petroleum of the World, John Wiley & Sons — Australian chapter extract below is hilarious) mentions Mount Wynne. I assume that this was discovered by Torrington Blatchford as his Kimberley oil field note book spans 1921–1925 and those old publications took years to

prepare; however, I would have to look at that notebook to verify the assumption.
I collected the Mt Wynne seep from the hot spring at 18° 06' 15”S 124° 28' 06"E following instructions (and using the basic equipment) provided by s 22 on two occasions. I’m certain s 22 has the dates recorded.
Cheers
s 22

AUSTRALIA

INTRODUCTION

Australia is the largest island in the world, with an area of 3,000,000 square miles and a population of about 5,000,000. It forms the Commonwealth of Australia, which includes the colonies of New South Wales, Victoria, Queensland, South Australia, Western Australia, and Tasmania. The transportation and communication facilities include about 23,000 miles of Government-owned railway and many miles of telegraph and telephone lines.

The Commonwealth is a British Territory, with executive power vested in a Governor General appointed by the King, and legislative power vested in a representative Parliament. Prior to the War, Government revenues exceeded expenditures; the accumulated surplus at the end of 1922 was about $15,000,000, which offsets an estimated budget deficit of $12,000,000. The National Debt is estimated at about $1,956,000,000.

Australia leads the world in wool production. Sheep and cattle raising and agriculture are the leading industries; wheat, oats, maize, barley, hay, and potatoes are the chief products. Exports go chiefly to Great Britain, the United States, and New Zealand, and include wheat and wool. Imports, including cotton piece goods and other textiles, metal manufacturers, and machines, come from Great Britain and the United States.

PETROLEUM RESOURCES

Oil indications are reported in the northern part of Western Australia near Mount Wynne in the Kimberley District, in the southwestern part near the confluence of the Warren and Donnelly Rivers near Cape Leeuwin; in the southeastern part of South Australia at Gawler near Adelaide, along Salt Creek near Meningie, at Bordertown, along the Coorong Lagoon, and on Kangaroo Island; in the southeastern part of Queensland, near Duaringa and Beaudesert (gas is also found near Ronna); in Victoria northwest of Melbourne at Bridgewater, along the coast at Portland, Western Port, and Cape Patterson; and in the northwestern part of Tasmania in the Inglis and Don Valleys.

The oil shales of New South Wales are located along the coast from Twofold Bay to Jervis Bay, and farther north and inland at Coonamble and at Gunnedah. They are reported to be among the richest in the world. Prospecting is going on, but no development work of commercial value has been done.

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PETROLEUM LEGISLATION

Each Colony in Australia has its own mining legislation. In
general, these laws provide that only British subjects may receive
exploration or exploitation rights, for a period exceeding five years,
without the written consent of the Attorney General.
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From: s 22 @ga.gov.au>
Sent: Thursday, 13 February 2020 12:14 PM
To: s 22 @ga.gov.au>; s 22
<s 22 @dmirs.wa.gov.au>
Subject: Mount Wynne seep [SEC=OFFICIAL]

Hi s 22 and s 22

I got feedback from Buru Energy on gas sample depths so I can focus on finishing off this DAR on the raw geochemical data of the Canning Basin gases.

I would need the latitude and longitude of the Mount Wynne seep gas sample. Do you know them or let me know where I can get them?
Not sure Blatchford was the first one to note this gas seep (maybe as the first geologist) as it was reported in the Official Year Book of the Commonwealth of Australia No. 16 – 1923 and every official year book after that.
Any vague idea on how these gas seep samples were sampled?

Cheers,

s 22

s 22 | Organic Geochemist
Basin Systems | Minerals, Energy and Groundwater Division

t s 22 www.ga.gov.au